IN THE CLAIMS

Please replace all prior versions, and listings, of claims in the application with the following list of claims. Additions are indicated by underlining and deletions are indicated by strikeouts.

1-37. (Cancelled)

38. (Original) An apparatus, comprising:
at least one nanoscale wire constructed and arranged to generate amplified stimulated emission of radiation, the at least one nanoscale wire including a first type semiconductor material; and
a substrate,
wherein the apparatus is constructed and arranged such that at least first carrier types are injected along at least a portion of a length of the at least one nanoscale wire, in response to an electric signal from the substrate, to facilitate generation of the amplified stimulated emission of the radiation.

39. (Original) The apparatus of claim 38, wherein the first type semiconductor material is an n-type semiconductor material.

40. (Original) The apparatus of claim 38, wherein the first carrier types are holes.

41. (Original) The apparatus of claim 38, wherein the first type semiconductor material is a p-type semiconductor material.

42. (Original) The apparatus of claim 38, wherein the first carrier types are electrons.

43. (Original) The apparatus of claim 38, further comprising at least one second type semiconductor material electrode, wherein the at least one nanoscale wire is arranged with respect to the at least one second type semiconductor material electrode to form at least one

p-n junction, such that, in response to the electric signal, at least some of the first carriers are injected along at least the portion of the length of the at least one nanoscale wire via the at least one second type semiconductor material electrode.

44. (Original) The apparatus of claim 43, wherein:
the first type semiconductor material is an n-type semiconductor material;
the second type semiconductor material is a p-type semiconductor material; and
the first carrier types are holes.

45. (Original) The apparatus of claim 43, wherein:
the first type semiconductor material is a p-type semiconductor material;
the second type semiconductor material is an n-type semiconductor material; and
the first carrier types are electrons.

46. (Original) The apparatus of claim 43, further comprising a second type semiconductor layer disposed on the substrate,
wherein the at least one second type semiconductor material electrode is defined in the second type semiconductor layer.

47. (Original) The apparatus of claim 46, wherein:
the first type semiconductor material is a p-type semiconductor material;
the second type semiconductor material is an n-type semiconductor material;
the second type semiconductor layer is an n-type semiconductor layer; and
the first carrier types are electrons.

48. (Original) The apparatus of claim 46, wherein:
the first type semiconductor material is an n-type semiconductor material;
the second type semiconductor material is a p-type semiconductor material;

the second type semiconductor layer is a p-type semiconductor layer; and
the first carrier types are holes.

49. (Original) The apparatus of claim 48, wherein:
the at least one nanoscale wire is formed of cadmium sulfide; and
the at least one p-type electrode is formed of doped silicon.

50. (Original) The apparatus of claim 49, wherein the doped silicon has a doping concentration of approximately $4 \times 10^{19}/cm^3$.

51. (Original) The apparatus of claim 48, further comprising at least one metal layer in contact with the at least one nanoscale wire to provide for the injection of electrons into the at least one nanoscale wire.

52. (Original) The apparatus of claim 51, further comprising at least one insulating layer disposed between at least a portion of the at least one nanoscale wire and the at least one metal layer.

53. (Original) The apparatus of claim 52, wherein the at least one insulating layer includes aluminum oxide.

54. (Original) The apparatus of claim 38, wherein the at least one nanoscale wire includes at least one cadmium selenide nanoscale wire.

55. (Original) The apparatus of claim 38, wherein the at least one nanoscale wire includes at least one zinc selenide nanoscale wire.

56. (Original) The apparatus of claim 38, wherein the at least one nanoscale wire includes at least one zinc oxide nanoscale wire.

57. (Original) The apparatus of claim 38, wherein the at least one nanoscale wire includes at least one gallium nitride nanoscale wire.

58. (Original) The apparatus of claim 38, wherein the at least one nanoscale wire includes at least one indium phosphide nanoscale wire.

59. (Original) The apparatus of claim 38, wherein the at least one nanoscale wire is constructed and arranged to generate amplified stimulated emission of visible radiation.

60. (Original) The apparatus of claim 38, wherein the at least one nanoscale wire is constructed and arranged to generate amplified stimulated emission of ultraviolet radiation.

61. (Original) The apparatus of claim 38, wherein the at least one nanoscale wire is constructed and arranged to generate amplified stimulated emission of infrared radiation.

62. (Original) The apparatus of claim 38, wherein the at least one nanoscale wire has a diameter in a range of approximate 50 nanometers to 1000 nanometers.

63. (Original) The apparatus of claim 62, wherein the at least one nanoscale wire has a diameter in a range of approximate 80 nanometers to 200 nanometers.

64. (Original) The apparatus of claim 38, wherein the at least one nanoscale wire is constructed and arranged as an optical cavity.

65. (Original) The apparatus of claim 38, wherein the at least one nanoscale wire is constructed and arranged as a Fabry-Perot resonator.

66. (Previously presented) The apparatus of claim 38, wherein the at least one nanoscale wire is cleaved so as to provide two end reflectors that define the Fabry-Perot resonator.

67. (Original) The apparatus of claim 66, wherein the two end reflectors are formed by solution phase sonication of the at least one nanoscale wire.

68. (Original) The apparatus of claim 66, wherein the at least one nanoscale wire is constructed and arranged such that at least one of the two end reflectors includes at least one Bragg grating.

69. (Original) The apparatus of claim 68, wherein the at least one Bragg grating is formed by axial composition modulation of the at least one nanoscale wire.

70. (Original) The apparatus of claim 38, wherein the at least one nanoscale wire includes:
a core having a first type semiconductor material; and
at least one shell having a second type semiconductor material so as to form at least one p-n junction with the core.

71. (Original) The apparatus of claim 70, wherein:
the first type semiconductor material is an n-type semiconductor material;
the second type semiconductor material is a p-type semiconductor material; and
the first carrier types are holes.

72. (Original) The apparatus of claim 70, wherein:
the first type semiconductor material is a p-type semiconductor material;
the second type semiconductor material is an n-type semiconductor material; and
the first carrier types are electrons.

73. (Original) The apparatus of claim 70, wherein the core is formed of cadmium sulfide.

74. (Original) The apparatus of claim 70, wherein the core is formed of cadmium selenide.

75. (Original) The apparatus of claim 70, wherein the core is formed of zinc sulfide.

76. (Original) The apparatus of claim 70, wherein the core is formed of zinc oxide.

77. (Original) The apparatus of claim 70, wherein the core is formed of gallium nitride.

78. (Original) The apparatus of claim 70, wherein the core is formed of indium phosphide.

79. (Original) The apparatus of claim 70, wherein the at least one nanoscale wire is constructed and arranged to generate amplified stimulated emission of visible radiation.

80. (Original) The apparatus of claim 70, wherein the at least one nanoscale wire is constructed and arranged to generate amplified stimulated emission of ultraviolet radiation.

81. (Original) The apparatus of claim 70, wherein the at least one nanoscale wire is constructed and arranged to generate amplified stimulated emission of infrared radiation.

82. (Original) The apparatus of claim 70, wherein the at least one nanoscale wire has a diameter in a range of approximate 50 nanometers to 1000 nanometers.

83. (Original) The apparatus of claim 82, wherein the at least one nanoscale wire has a diameter in a range of approximate 80 nanometers to 200 nanometers.

84. (Original) The apparatus of claim 70, wherein the at least one nanoscale wire is constructed and arranged as an optical cavity.

85. (Original) The apparatus of claim 84, wherein the at least one nanoscale wire is constructed and arranged as a Fabry-Perot resonator.

86. (Original) The apparatus of claim 85, wherein the at least one nanoscale wire is cleaved so as to provide two end reflectors that define the Fabry-Perot resonator.

87. (Original) The apparatus of claim 86, wherein the two end reflectors are formed by solution phase sonication of the at least one nanoscale wire.

88. (Original) The apparatus of claim 86, wherein the at least one nanoscale wire is constructed and arranged such that at least one of the two end reflectors includes at least one Bragg grating.

89. (Original) The apparatus of claim 88, wherein the at least one Bragg grating is formed by axial composition modulation of the at least one nanoscale wire.

90-107. (Cancelled)

108. (Previously Pending) A method of fabricating a nanoscale laser comprising:
a) forming at least one nanoscale wire from a first type semiconductor material;
b) forming the at least one nanoscale wire into an optical cavity; and
c) coupling the at least one nanoscale wire to at least one electrode formed from a second type semiconductor material, the at least one electrode being formed in a semiconductor layer coupled to a substrate.

109. (Original) The method of claim 108, wherein the first type semiconductor material is an n-type semiconductor material.

110. (Original) The method of claim 108, wherein the second type semiconductor material is a p-type semiconductor material.

111. (Original) The method of claim 108, wherein the first type semiconductor material is a p-type semiconductor material.

112. (Original) The method of claim 108, wherein the second type semiconductor material is an n-type semiconductor material.

113. (Cancelled)

114. (Previously Pending) The method of claim 108, further comprising an act of:
forming at least one metal layer in contact with the at least one nanoscale wire.

115. (Original) The method of claim 114, further comprising an act of:
forming at least one insulating layer disposed between at least a portion of the at least one nanoscale wire and the at least one metal layer.

116. (Original) The method of claim 115, wherein the at least one insulating layer includes a layer of aluminum oxide.

117. (Previously Pending) A method of fabricating a nanoscale wire optical cavity, comprising:
a) forming at least one Bragg grating on at least one nanoscale wire; and
b) positioning the nanoscale wire on a substrate such that carriers can be injected from the substrate into at least a portion of the nanoscale wire.

118. (Original) The method of claim 117, wherein the act a) includes an act of:
a1) forming the optical cavity as a Fabry-Perot resonator.

119. (Original) The method of claim 118, wherein the act a1) includes an act of:
a2) cleaving the at least one nanoscale wire so as to provide two end reflectors that define the Fabry-Perot resonator.

120. (Original) The method of claim 119, wherein the act a2) includes an act of:
a3) forming the two end reflectors by solution phase sonication of the at least one nanoscale wire.

121. (Original) The method of claim 118, wherein the act a1) includes an act of:
a2) forming at least one of the two end reflectors as the at least one Bragg grating.

122. (Original) The method of claim 121, wherein the act a2) includes an act of:
a3) forming the at least one Bragg grating by axial composition modulation of the at least one nanoscale wire.

123. (Original) The method of claim 117, wherein the act a) includes an act of:
forming the at least one nanoscale wire both as the optical cavity and a gain medium.

124-125. (Cancelled)

126. (Previously Pending) A method of generating amplified stimulated emission of radiation, comprising an act of:
applying an electric signal from a substrate along at least a portion of a length of a nanoscale wire formed as an optical resonator.

127. (Previously Pending) An apparatus, comprising:
an electrical injection laser including a nanoscale wire constructed and arranged to receive carriers from a substrate along at least a portion of a length of the nanoscale wire.

128. (Original) The apparatus of claim 127, wherein the nanoscale wire is made entirely or in part of at least one material selected from the group consisting of cadmium sulfide, cadmium selenide, zinc selenide, zinc oxide, gallium nitride, indium phosphide, and combinations thereof.

129. (Cancelled)